

REMARKS

This Amendment is submitted in response to the Office Action dated June 4, 2003. Claims 1-20 were previously pending. In this response, new dependent claims 21-22 are added. Accordingly, claims 1-22 stand for consideration. It is most respectfully submitted that entry of these amendments after final rejection should be appropriate. Careful reconsideration of the present application in view of the foregoing amendments and the following remarks is most respectfully requested.

Rejections Under 35 U.S.C. 112:

In paragraphs 1-2, claims 1-20 were rejected under 35 U.S.C. 112, Second Paragraph, as allegedly being indefinite. These rejections are most respectfully traversed as follows.

First, it is most respectfully submitted that the claims as now amended are proper under this section of the U.S. code. In that regard, while it is submitted that the original claims were already clear, the claims have been amended to be even clearer. These amendments should, thus, not limit the fullest range of protection under the doctrine of equivalents upon issuance.

Second, it is most respectfully submitted that the language "a desired portion" should be well understood based on the present disclosure. It is respectfully submitted

that the language is broad enough to encompass situations in which, for example, 1) all of the feed material is fed into the melter in a manner to melt a desired portion and 2) a part of the feed material is fed into the melter in a manner to melt a desired portion.

See, e.g., page 5, lines 14-17 and page 6, lines 6-10 quoted below:

According to the present invention all solid raw materials (solid fertilizer raw materials and optionally recycle material, micro nutrients and fillers) can be introduced into the melter. However, it is also possible to introduce a part of the solid raw materials into the melter.

Third, it is most respectfully submitted that the language "other desired" solid raw materials was proper under this section of the U.S. code. However, this objected to language has been removed. It is respectfully submitted that, while broad, the language "solid raw materials" is clearly definite under 35 U.S.C. 112. See also above-noted language regarding solid raw materials.

Fourth, it is most respectfully submitted that the Patent Office has incorrectly indicated that "[t]he specification does not provide information about how raw material supplied to a melter provides a 'partly molten material.'" By way of example, see the language quoted above.

Fifth, it is most respectfully submitted that the Patent Office has incorrectly indicated that "it is also not clear what amount 'partly' represents." It is most respectfully submitted that this language, while broad, is clear. As some illustrative and

non-limiting examples, new claims 21-22 provide some illustrative percentages. These illustrative examples should not be construed as limiting the breadth of claim 1.

Withdrawal of these rejections is most respectfully requested.

Rejections Based On References:

In response to the rejections under 35 U.S.C. 103 in paragraphs 3-9 of the Office Action, the prior arguments are incorporated herein by reference. It is respectfully submitted that the Patent Office's rejections are improper and should be withdrawn. Careful reconsideration is most respectfully requested. In addition, in paragraph 10 under the Section entitled "Response to Arguments," the Patent Office sets forth new bases for rejection and/or objection. These rejections are also most respectfully traversed.

Among other things, it is most respectfully submitted that the Patent Office has incorrectly stated the following:

It is surmised that even though applicant partly melts his raw material and does not allow all of it to be in the molten state ... a complete melt would be achieved during the granulation process ... Therefore, little difference is seen between this method and prior art methods.

First, the Patent Office's remarks overlook, e.g., dependent claims 12 and 19, which indicate that granulation temperature is in the range from about 80 degrees C to about 110 degrees C (claim 12) and from about 80 degrees C to about 125 degrees C (claim 19).

Second, it is most respectfully submitted that in some embodiments, the process can achieve notable unexpected results, such as, e.g., set forth in the prior Amendment at pages 13-14. It is most respectfully submitted that the Patent Office has improperly a) ignored differences in certain embodiments of the invention and b) ignored advantages achievable with certain embodiments of the invention. The fact remains that there are clear differences in and clear advantages from certain embodiments of the invention.

Third, it is most respectfully submitted that the Patent Office has incorrectly asserted that a complete melt would be achieved during the process. It is most respectfully noted, e.g., that in the preferred embodiments of the present invention, part of the material remains in a non-molten state. It is submitted that the preferred embodiments of the present invention are not comparable with existing techniques that use, e.g., different combinations and/or means for forming granules, such as for example, wherein:

- a friction heat is created by pressing a solid fertilizer material in a press machine (such as an extruder, a tableting press, or a screen plate), whereby during the pressing step the feed material melts at least partly so that it becomes moldable to a predetermined shape in the machine;

- part of the fertiliser material is molten separately and then sprayed on solid particles in order to coat the particles; or
- a prilling process is used, wherein molten fertiliser material or a mixture of molten fertiliser material with a very finely divided, homogeneous solid particles is formed to droplets and solidified as droplets in an air or an oil bath.

As explained above, it is submitted that the preferred embodiments of the present invention are not comparable with existing techniques that use, e.g., different combinations and/or means for forming granules. It is most respectfully submitted that the references cited merely represent some of such non-comparable existing techniques.

With respect to, e.g., the JP 74049116 and US 6,176,892 references, these references appear to involve typical prilling methods, wherein a molten urea is formed to droplets, e.g. by spraying, and the droplets are solidified. If solids are combined with the urea melt, this is normally combined before the formation of spray. Apparently, if a mixture of particles and the melt is used, it needs to be homogenized into a uniform slurry before droplet formation (see column 3, lines 8-14). On the other hand, in the preferred embodiments of the present application, no droplets need to be formed, but rather, the method involves “granulating ... with a granulator.” The preferred embodiments would not enable such homogenization step. In addition, in the JP 74049116 reference, the granulation appears to be effected by drying the formed droplets of such a homogenized melt (see Abstract).

With respect to the US 6,176,892 patent, it is submitted that this patent does not

teach or suggest, e.g., the use of urea as a raw material. Moreover, the temperatures used should apparently decompose urea. Accordingly, the '892 patent should not be applicable to a urea-containing fertiliser. In fact, the '892 patent indicates on column 3, lines 20-23, that the melt or suspension is either prilled (see above) or granulated using, apparently, a granulation process involving water 10-2.5 wt-%. According to example 3, the water content must first be reduced before the granulation. On the other hand, claim 1 recites, among other things, that "no water or aqueous liquid is introduced into the process."

With respect to the GB 1462633 reference, it is submitted that urea is melted separately and then sprayed on the surface of solid urea particles (e.g. recycled urea particles) in order to achieve the growth of the solid particles. Moreover, the melt of urea is obtained by flash evaporating a solution of urea in water. On the other hand, the reference does not teach or suggest the combination of features recited in claim 1, such as, e.g., including a) "providing a solid feed material comprising ... solid urea," b) "melting a desired portion ... without melting another portion of said feed material," and then c) "granulating the partly molten feed material ... with a granulator," much less the substantial advantages that can be achieved in some embodiments. In actuality, the GB 1462633 reference appears to imply that a separate melting procedure and spraying step are needed in order to control the granule growth in the granulator.

With respect to the SU 304824 reference, apparently urea is completely molten separately and solid mineral particles of 200 microns are added to the molten urea. See Abstract. Due to the properties of ammonium phosphate, it appears that these added particles act as "cores" which are "coated" with the melt. While the melting point

thereof is not known, apparently it starts to form polyphosphate at a temperature around 200C. There is no teaching or suggestion for, e.g., starting from "a solid feed material," providing "a partly molten feed material," and then "granulating the partly molten feed material" as recited in claim 1.

With respect to the JP 7157385 reference, apparently the fertilizer feed is pressed through a compacting machine (i.e., an extruder or a similar screen plate) or is pressed in a tablet machine so that heat is formed due to the friction, whereby the mass melts and can be molded to a predetermined shape. Thus, the granules or prills are formed by pressing. There is no teaching or suggestion for, e.g., starting from "a solid feed material," providing "a partly molten feed material," and then "granulating the partly molten feed material" as recited in claim 1.

In some exemplary embodiments of the present invention, a non-molten part of a urea-containing feed can be maintained as solid particles. They do not have to melt during the process. Among other things, the molten part of the feed can form agglomerates with the non-molten particles by crystallizing on the surface thereof so that, e.g., an unexpectedly good granulation (e.g., uniform granules) can be obtained – see, e.g., some of the examples cited in the present application. In addition, in exemplary embodiments where an optional further solid feed material is added to a partially molten feed, the molten part can crystallize in the granulator and bind the added further feed material together with the non-molten particles present in a partly urea-containing molten feed. In this manner, for example, granules can be obtained that contain an initial urea-containing material and an optional added further feed material.

Accordingly, in some preferred embodiments, good granulation with good product properties can be achieved (e.g. good strength, see page 6, line 30), very economically, and without the use of water. Additionally, in embodiments involving a continuous process, the recycling ratios (see, e.g., page 6, lines 11-17, of the corresponding PCT-publication) can also be very acceptable as derivable from the examples. Thus, some preferred embodiments of the present invention can be very feasible for, e.g., continuous granulation processes.

Among other things, the prior art does not teach or suggest the combination of features recited in claim 1, including, e.g.:

- (1) "a partly molten feed;"
- (2) "granulating the partly molten feed ... with a granulator to obtain ..."
- (3) "a granulated product" ... comprising "urea" in a process for the preparation of compound fertilizer granules containing plant nutrient nitrogen and at least one of the plant nutrients phosphorus and potassium."

In addition, the potential good granulation and good physical properties of the granules and the potential applicability of a "simplified" method for a continuous process with industrially acceptable recycling ratios would not been expected or predicted from the prior art.

Withdrawal of these rejections is most respectfully requested.

C ncluding Remarks:

In the event that any fees are due in connection with this document, please charge our Deposit Account No. 02-2135. Should the Examiner desire to discuss any aspect of this case, the Examiner is encouraged to contact the undersigned.

Respectfully submitted,

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